

-57-

WHAT IS CLAIMED IS:

1. A method of establishing a set of piconets comprising:
generating a set of codes, wherein each code corresponds to
a sequence of dwell times and bands, wherein the
sequence includes at least one group of dwell times; and
assigning codes to the piconets in the set of piconets,
wherein:
each piconet in the set of piconets has a unique code
compared to the other piconets in the set of
piconets, wherein the unique code is a member of
the set of codes; and
during a time span, any two different piconets in the
set of piconets are capable of using one or more
same bands for a collective time for each group of
dwell times, no longer than the longest dwell time
within such group of dwell times.
2. The method of claim 1, wherein one or more numbers of the
dwell times in the groups is one or more prime numbers.
3. The method of claim 2, wherein the one or more number of the
dwell times in each group is seven.
4. The method of claim 3, wherein a number of different bands
for the each group is seven.
5. The method of claim 3, wherein a number of different bands
for the each group is six.

-58-

6. The method of claim 3, wherein a number of different bands for the each group is three.
7. The method of claim 2, wherein a number of piconets within the set of piconets is no greater than a sum of the one or more prime number minus one for each group of dwell times.
8. The method of claim 1, further comprising changing a state of a band within at least one of the codes for at least one piconet from a first state to a second state, wherein:
the first state is a designated state or an undesignated state; and
the second state is the other of the designated state or the undesignated state.
9. The method of claim 1, further comprising substituting an extra band for an existing band, wherein before substituting, the unique codes do not correspond to the extra band.
10. The method of claim 1, wherein each of the bands has a frequency range of at least 400 MHz.
11. The method of claim 1, wherein the set of piconets is designed for a wireless communicating medium.
12. The method of claim 1, further comprising adding another piconet to the set of piconets, wherein the another piconet has a unique code compared to previously existing piconets within the set of piconets.

-59-

13. A set of piconets comprising piconets, wherein:
each piconet in the set of piconets has a unique code
compared to the other piconets in the set of piconets,
wherein the each unique code corresponds to a sequence
of dwell times and bands, wherein the sequence includes
at least one group of dwell times; and
during a time span, any two different piconets in the set
of piconets are capable of using one or more same bands
for a collective time for each group of dwell times, no
longer than the longest dwell time within such group of
dwell times.
14. The set of piconets of claim 13, wherein one or more number
of the dwell times in the groups is one or more prime
numbers.
15. The set of piconets of claim 14, wherein the one or more
number of the dwell times in each group is seven.
16. The set of piconets of claim 15, wherein a number of
different bands for the each group is seven.
17. The set of piconets of claim 15, wherein a number of
different bands for the each group is six.
18. The set of piconets of claim 15, wherein a number of
different bands for the each group is three.
19. The set of piconets of claim 14, wherein a number of
piconets within the set of piconets is no greater than a sum

-60-

of the one or more prime number minus one for each group of dwell times.

20. The set of piconets of claim 13, wherein each of the bands for each piconet is in a first state or a second state, wherein:
 - the first state is a designated state; and
 - the second state is an undesignated state.
21. The set of piconets of claim 13, wherein each of the bands has a frequency range of at least 400 MHz.
22. The set of piconets of claim 13, wherein the set of piconets is designed for a wireless communicating medium.
23. The set of piconets of claim 13, wherein a device, within a first piconet within the set of piconets, is capable of communicating simultaneously over at least two bands within the first piconet.

-61-

24. A set of piconets comprising a first piconet and a second piconet, wherein within the set of piconets:
- the first piconet has a first code corresponding to a first sequence of designated bands; and
 - the second piconet has a second code that corresponds to a second sequence of designated bands; and
 - at least one band is present in the first sequence that is not present in the second sequence.
25. The set of piconets of claim 24, wherein:
- the first piconet is configured for a first group of bands and a second group of bands; and
 - the second piconet is configured for the first group of bands but not the second group of bands.
26. The set of piconets of claim 25, wherein at least one of the bands within the first group of bands is in an undesignated state.
27. The set of piconets of claim 25, wherein each of the first group of bands and the second group of bands comprise a prime number of bands.
28. The set of piconets of claim 24, wherein the first and second piconets are configured for the same group or groups of bands.

-62-

29. A method of using a set of piconets comprising changing a first band from a designated state to an undesignated state, so that a first piconet cannot communicate within the set of piconets using the first band, wherein:

the set of piconets comprises the first piconet;
each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the each unique code corresponds to a sequence of dwell times and bands including the first band, wherein the sequence includes at least one group of dwell times.

30. The method of claim 29, further comprising transmitting data within the first piconet using a second band, wherein:

the unique code for the first piconet corresponds to the second band;
the second band is in the designated state when transmitting is performed; and
transmitting is performed after changing the first band from the designated state to the undesignated state.

31. The method of claim 30, wherein the data that would be transmitted using the first band, if the first band would be in the designated state, is transmitted using the second band.

32. The method of claim 31, further comprising changing the first band from the undesignated state to the designated state after transmitting the data.

-63-

33. The method of claim 29, further comprising substituting an extra band for the first band, wherein before substituting, the unique codes do not correspond to the extra band.
34. The method of claim 33, further comprising transmitting data within the first piconet using the extra band, wherein: the unique code for the first piconet corresponds to the extra band; the extra band is in the designated state when transmitting is performed; and transmitting is performed after substituting the extra band for the first band.
35. The method of claim 29, further comprising communicating simultaneously over at least two bands using a device within the first piconet.
36. The method of claim 29, further comprising adding another piconet to the set of piconets, wherein the another piconet has its own unique code compared to the unique codes for previously existing piconets within the set of piconets.
37. The method of claim 29, wherein a number of the dwell times in each group is seven.
38. The method of claim 37, wherein a number of different bands for the each group is seven.
39. The method of claim 37, wherein a number of different bands for the each group is six.

ATTORNEY DOCKET NO.
ALER0001

CUSTOMER NO. 25094

-64-

40. The method of claim 37, wherein a number of different bands
for the each group is three.

-65-

41. A method of using a set of piconets comprising changing a first band from a designated state to an undesignated state, wherein:

the set of piconets comprises the first piconet;
each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the each unique code corresponds to a sequence of dwell times and bands including the first band, wherein the sequence includes at least one group of dwell times.

42. The method of claim 41, further comprising transmitting data within the first piconet using a second band, wherein:

the unique code for the first piconet corresponds to the second band;

the second band is in the designated state when transmitting is performed; and

transmitting is performed after changing the first band from the designated state to the undesignated state.

43. The method of claim 42, wherein the data that would be transmitted using the first band, if the first band would be in the designated state, is transmitted using the second band.

44. The method of claim 41, further comprising changing the first band from the undesignated state to the designated state after transmitting the data.

-66-

45. The method of claim 41, further comprising substituting an extra band for the first band, wherein before substituting, the unique codes do not correspond to the extra band.
46. The method of claim 45, further comprising transmitting data within the first piconet using the extra band, wherein:
the unique code for the first piconet corresponds to the extra band;
the first band is in the undesignated state when transmitting is performed; and
transmitting is performed after substituting the extra band for the first band.
47. The method of claim 41, further comprising communicating simultaneously over at least two bands using a device within the first piconet that is within the set of piconets.
48. The method of claim 41, further comprising adding another piconet to the set of piconets, wherein the another piconet has its own unique code compared to the unique codes for previously existing piconets within the set of piconets.
49. The method of claim 41, wherein a number of the dwell times in each group is seven.
50. The method of claim 49, wherein a number of different bands for the each group is seven.
51. The method of claim 49, wherein a number of different bands for the each group is six.

ATTORNEY DOCKET NO.
ALER0001

CUSTOMER NO. 25094

-67-

52. The method of claim 49, wherein a number of different bands
for the each group is three.

-68-

53. A method of using a set of piconets comprising changing a first band from an undesignated state to a designated state, wherein:

the set of piconets comprises the first piconet;
each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the each unique code corresponds to a sequence of dwell times and bands including the first band, wherein the sequence includes at least one group of dwell times.

54. The method of claim 53, further comprising transmitting data within the first piconet using the first band, wherein:

the unique code for the first piconet corresponds to a second band;
the second band is in the undesignated state when transmitting is performed; and
transmitting is performed after changing the first band from the undesignated state to the designated state.

55. The method of claim 54, wherein the data that would be transmitted using the second band, if the second band would be in the designated state, is transmitted using the first band.

56. The method of claim 53, further comprising changing the first band from the designated state to the undesignated state after transmitting the data.

-69-

57. The method of claim 53, further comprising substituting an extra band for the second band, wherein before substituting, the unique codes do not correspond to the extra band.
58. The method of claim 57, further comprising transmitting data within the first piconet using the extra band, wherein: the unique code for the first piconet corresponds to a second band; the second band is in the undesignated state when transmitting is performed; and transmitting is performed after substituting the extra band for the second band.
59. The method of claim 53, further comprising communicating simultaneously over at least two bands using a device within the first piconet that is within the set of piconets.
60. The method of claim 53, further comprising adding another piconet to the set of piconets, wherein the another piconet has its own unique code compared to the unique codes for previously existing piconets within the set of piconets.
61. The method of claim 53, wherein a number of the dwell times in each group is seven.
62. The method of claim 61, wherein a number of different bands for the each group is seven.
63. The method of claim 61, wherein a number of different bands for the each group is six.

ATTORNEY DOCKET NO.
ALER0001

CUSTOMER NO. 25094

-70-

64. The method of claim 61, wherein a number of different bands
for the each group is three.

-71-

65. A computer program for establishing a set of piconets, the computer program comprising a computer-readable medium adapted to execute instructions when the computer program is run on a computer, the computer program comprising:
- an instruction for generating a set of codes, wherein each code corresponds to a sequence of dwell times and bands, wherein the sequence includes at least one group of dwell times; and
 - an instruction for assigning codes to the piconets in the set of piconets, wherein:
 - each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the unique code is a member of the set of codes; and
 - during a time span, any two different piconets in the set of piconets are capable of using one or more same bands for a collective time for each group of dwell times, no longer than the longest dwell time within such group of dwell times.
66. The computer program of claim 65, wherein one or more numbers of the dwell times in the groups is one or more prime numbers.
67. The computer program of claim 66, wherein the one or more number of the dwell times in each group is seven.
68. The computer program of claim 67, wherein a number of different bands for the each group is seven.

-72-

69. The computer program of claim 67, wherein a number of different bands for the each group is six.
70. The computer program of claim 67, wherein a number of different bands for the each group is three.
71. The computer program of claim 66, wherein a number of piconets within the set of piconets is no greater than a sum of the one or more prime number minus one for each group of dwell times.
72. The computer program of claim 65, wherein the computer program further comprises an instruction for changing a state of a band within at least one of the codes for at least one piconet from a first state to a second state, wherein:
the first state is a designated state or an undesignated state; and
the second state is the other of the designated state or the undesignated state.
73. The computer program of claim 65, wherein the computer program further comprises an instruction for substituting an extra band for an existing band, wherein before executing the instruction for substituting, the unique codes do not correspond to the extra band.
74. The computer program of claim 65, wherein each of the bands has a frequency range of at least 400 MHz.

-73-

75. The computer program of claim 65, wherein the set of piconets is designed for a wireless communicating medium.
76. The computer program of claim 65, wherein the computer program further comprising an instruction for adding another piconet to the set of piconets, wherein the another piconet has a unique code compared to previously existing piconets within the set of piconets.

-74-

77. A computer program for using a set of piconets, the computer program comprising a computer-readable medium adapted to execute instructions when the computer program is run on a computer, the computer program comprising an instruction for changing a first band from a designated state to an undesignated state, so that the first piconet cannot communicate within a set of piconets using the first band, wherein:

the set of piconets comprises the first piconet;
each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the each unique code corresponds to a sequence of dwell times and bands including the first band, wherein the sequence includes at least one group of dwell times; and
for the first piconet, the first band is in a designated state before executing the instruction for changing.

78. The computer program of claim 77, wherein the computer program further comprises an instruction for transmitting data within the first piconet using a second band, wherein:
the unique code for the first piconet corresponds to the second band;
the second band is in the designated state when transmitting is performed; and
the instruction for transmitting is executed after the instruction for changing the first band from the designated state to the undesignated state is executed.

-75-

79. The computer program of claim 78, wherein the data that would be transmitted using the first band, if the first band would be in the designated state, is capable of being transmitted using the second band when the instruction for transmitting is executed.
80. The computer program of claim 78, wherein the computer further comprises an instruction for changing the first band from the undesignated state to the designated state after executing the instruction for transmitting the data.
81. The computer program of claim 77, wherein the computer program further comprises an instruction for substituting an extra band for the first band, wherein before executing the instruction for substituting, the unique codes do not correspond to the extra band.
82. The computer program of claim 81, wherein the computer program further comprises an instruction for transmitting data within the first piconet using the extra band, wherein:
the unique code for the first piconet corresponds to the extra band; and
the instruction for transmitting is executed after the instruction for substituting is executed.
83. The computer program of claim 77, wherein the computer program further comprises an instruction for adding another piconet to the set of piconets, wherein the another piconet has its own unique code compared to the unique codes for previously existing piconets within the set of piconets.

-76-

84. The computer program of claim 77, wherein one or more numbers of the dwell times in the groups is one or more prime numbers.
85. The computer program of claim 84, wherein a number of different bands for the each group is seven.
86. The computer program of claim 84, wherein a number of different bands for the each group is six.
87. The computer program of claim 84, wherein a number of different bands for the each group is three.

-77-

88. A computer program for using a set of piconets, the computer program comprising a computer-readable medium adapted to execute instructions when the computer program is run on a computer, the computer program comprising an instruction for changing a first band from an undesignated state to a designated state, so that the first piconet can communicate within a set of piconets using the first band, wherein:
- the set of piconets comprises the first piconet;
 - each piconet in the set of piconets has a unique code compared to the other piconets in the set of piconets, wherein the each unique code corresponds to a sequence of dwell times and bands including the first band, wherein the sequence includes at least one group of dwell times; and
 - for the first piconet, the first band is in an undesignated state before executing the instruction for changing.
89. The computer program of claim 88, wherein the computer program further comprises an instruction for transmitting data within the first piconet using the first band, wherein:
- the unique code for the first piconet corresponds to a second band;
 - the second band is in the undesignated state when transmitting is performed; and
 - the instruction for transmitting is performed after the instruction for changing the first band from the undesignated state to the designated state is executed.

-78-

90. The computer program of claim 89, wherein the data that would be transmitted using the second band, if the second band would be in the designated state, is transmitted using the first band when the instruction for transmitting is executed.
91. The computer program of claim 89, wherein the computer program further comprises an instruction for changing the first band from the designated state to the undesignated state after transmitting the data.
92. The computer program of claim 88, wherein the computer program further comprises an instruction for substituting an extra band for the second band, wherein before executing the instruction for substituting, the unique codes do not correspond to the extra band.
93. The computer program of claim 92, wherein the computer program further comprises transmitting data within the first piconet using the second band, wherein:
the unique code for the first piconet corresponds to the extra band;
the second band is in the undesignated state when transmitting is performed; and
transmitting is performed after the instruction for substituting is executed.
94. The computer program of claim 88, wherein the computer program further comprises an instruction for adding another piconet to the set of piconets, wherein the another piconet

-79-

has its own unique code compared to the unique codes for previously existing piconets within the set of piconets.

95. The computer program of claim 88, wherein a number of the dwell times in each group is seven.

96. The computer program of claim 95, wherein a number of different bands is seven.

97. The computer program of claim 95, wherein a number of different bands is six.

98. The computer program of claim 95, wherein a number of different bands is three.

-80-

99. A piconet comprising a code that corresponds to the utilization of different bands during a time span of seven dwell times.
100. The piconet of claim 99, wherein a number of the different bands is seven.
101. The piconet of claim 99, wherein a number of the different bands is six.
102. The piconet of claim 99, wherein a number of the different bands is three.
103. The piconet of claim 99, further comprising at least two devices wherein each of the devices is capable of communicating to each other using the piconet.

-81-

104. A method of using a piconet comprising:
 assigning a code to a first device within the piconet,
 wherein the code corresponds to the utilization of
 different bands during a time span of seven dwell times;
 communicating using the first device to at least one other
 device using the piconet.
105. The method of claim 104, wherein a number of the different
 bands is seven.
106. The method of claim 104, wherein a number of the different
 bands is six.
107. The method of claim 104, wherein a number of the different
 bands is three.
108. The method of claim 104, further comprising changing a
 state of a band for at least one of the dwell times from a
 first state to a second state, wherein:
 the first state is a designated state or an undesignated
 state; and
 the second state is the other of the designated state or
 the undesignated state.
109. The method of claim 104, further comprising substituting an
 extra band for an existing band, wherein before substituting,
 the code does not correspond to the extra band.

-82-

110. The method of claim 104, wherein communicating comprises communicating simultaneously over at least two bands using the first device within the piconet.
111. The method of claim 104, wherein each of the bands has a frequency range of at least 400 MHz.
112. The method of claim 104, wherein communicating is performed using a wireless communicating medium.
113. The method of claim 104, further comprising adding another device to the piconet, wherein adding the another device comprises assigning the code to the another device.